Anesthesia for Emergencies: Rapid Sequence Induction (RSI)

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- Nearly simultaneous administration of induction agent and NMBA,after a period of preoxygenation and cardiopulmonray optimization for tracheal intubation

The Seven Ps of Rapid Sequence Intubation.

1. Preparation
2. Preoxygenation
3. Preintubation optimization
4. Paralysis with induction
5. Positioning
6. Placement of tube
7. Postintubation management

PREPARATION

- Oxygen source and tubing
- Ambu bag
- Mask with valve ,various sizes and shapes
- Oropharyngeal airways—small, medium, large
- Nasopharyngeal airways—small, medium, large
- Suction catheters :Yankauer, tracheal suction catheters, nasogastric suction connection tubing for particulate and large amounts of vomitus
- Suction source
- Pulse oximetry,cardiac monitors

- Carbon dioxide detector
- Endotracheal tubes—various sizes
- Laryngoscope blades and handles
- Syringes
- Magill forceps
- Stylets, assorted
- Tongue blade
- Intubating stylet (gum elastic bougie)
- Water-soluble lubricator anesthetic jelly
- Rescue devices : video laryngoscopes, laryngeal mask airway, intubating laryngeal mask airway, i-gel
- Surgical cricothyroidotomy kit
- Medications for topical airway anesthesia, sedation and rapid-sequence intubation

PREOXYGENATION

- Denitrogenation of lung alveoli and formation of oxygen rich reservoir within lung's FRC
- Make the patient breathe for 3 min at normal tidal volumes,100% oxygen at 15L/min flow through a NRBM
- When performed effectively,patient may have as much as to 6-8min of safe apnoea before O2 saturation falls to <90%
- If SpO2 remains <93% or less despite efforts - shift to BiPAP to increase the alveolar recruitment,reduce shunting and increase ETCo2

PREINTUBATION OPTIMIZATION

- to improve abnormal hemodynamic parameters prior intubation
- Isotonic fluids,blood products and pressor agents can be used

PARALYSIS

1. PRETREATMENT AGENTS
2. INDUCTION AGENTS
3. PARALYTIC AGENTS

PRETREATMENT AGENTS

- to reduce the sympathetic responses to laryngoscopy and intubation (tachycardia ,rise in BP and ICP)
- Laryngeal stimulation may cause laryngeal spasm ,cough and bronchospasm

Agent	Dose	Indications	Precautions
LIDOCAINE	1.5mg/kg IV/topically	elevated ICP,Bronchospasm, asthma	not known about effectiveness in ICP
FENTANYL	3micrograms/kg IV	elevated ICP, cardiac ischemia ,aortic dissection	respiratory depression,hypotension,chest wall rigidity

INDUCTION AGENTS

AGENT	DOSE	ONSET	DURATION	BENEFITS	CAVEATS
ETOMIDATE	0.3-0.5mg/kg IV	<1min	10-20min	↓ IC ↓ P IOP neutral BP	• myoclonic jerks/seizures and vomiting in awake patients • no analgesia • reduce cortisol
PROPOFOL	0.5-1.5mg/kg IV	20-40s	8-15mts	Antiemetic Anticonvulsant reduce ICP	• Apnoea • reduce BP • no analgesia
KETAMINE	1-2mg/kg IV	1min	10-20min	Bronchodilator dissociative amnesia analgesia	• increase secretion • increase BP • Emegence phenomenon

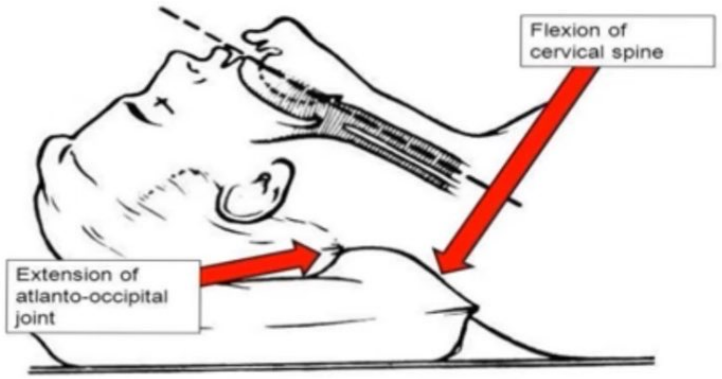
PARALYTIC AGENTS

AGENTS	DOSE	ONSET	DURATION	COMMENTS
ROCURONIUM	1mg/kg	1-3mins	30-45min	Tachycardia.Longer duration of action and onset compared to Succinyl choline
VECURONIUM	0.08-0.15mg/kg 0.15-0.28mg/kg(high dose protocol)	2-4min	25-40mt 60-120 min	Prolongrd recovery time in obese or elderly or if there is hepatorenal dysfunction
SUCCINYL CHOLINE	1.5mg/kg	45-60sec	5-9mt	provides optimal conditions most rapidly

POSITIONING

- Sniffing position with cervical spine extension and head elevation
- height should be adjusted up to the navel of the operator
- Sellick manoeuvre-application of firm ,backward pressure over cricoid cartilage with goal of obstructing cervical oesophagus and reducing the risk of aspiration

Sniffing Position



PLACEMENT OF TUBE

- Approximately 45-60 sec after administration of NMBA - relaxed sufficiently
- Place ETT during glottic visualisation with laryngoscope
- Confirm placement – 5 point auscilation and EtCO2

POSTINTUBATION MANAGEMENT

- Obtain a CXR
- Use opioid analgesic and sedatives to facilitate mechanical ventilation
- BZD eg:MIDAZOLAM 0.1-0.2 mg/kg IV and Opioid eg:FENTANYL 0.5-1 microgm/kg IV or MORPHINE 0.2-0.3mg/kg IV
- PROPOFOL infusion 0.05-0.1mg/kg/min IV with supplemental analgesia - if no hypotension or ongoing bleeding

SUPRAGLOTTIC AIRWAYS

- Devices placed in oropharynx ,allowing for oxygenation and ventilation without visualized or surgical insertion of a tube into the trachea
- Used in apneic unconscious patients
- Types:

1.I -GEL

2.KING LARYNGEAL TUBE

3.LARYNGEAL MASK AIRWAY

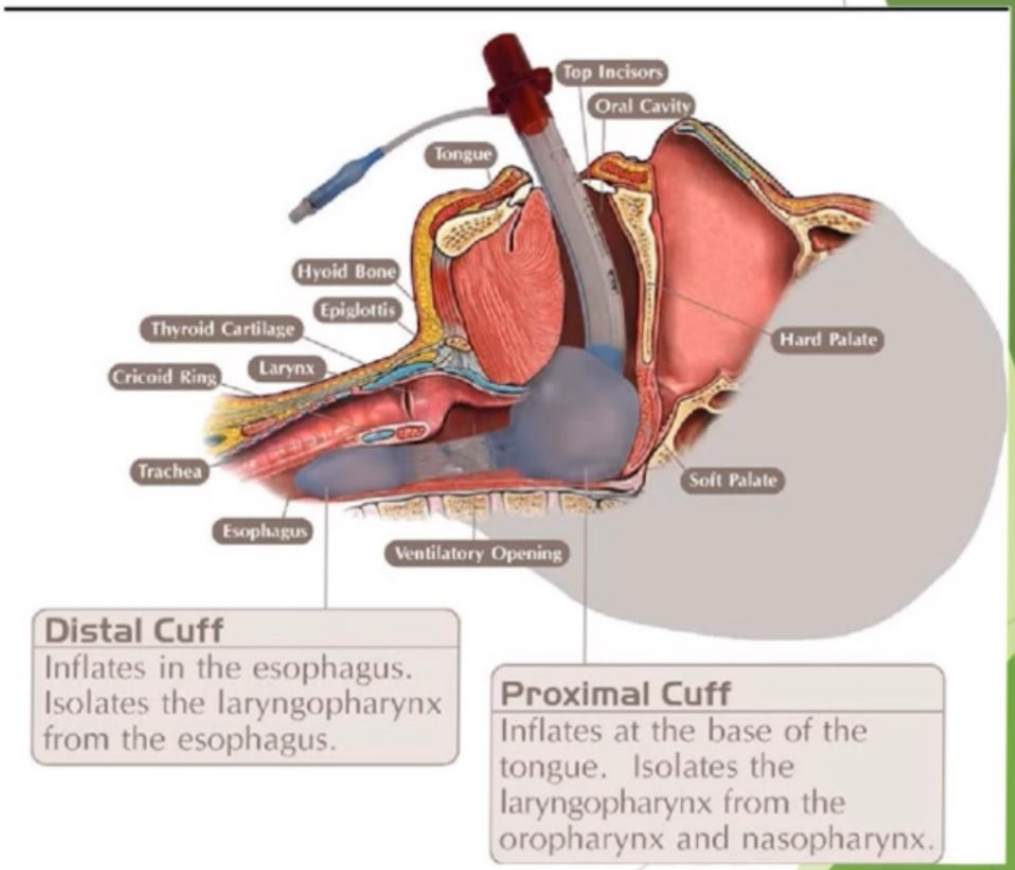
4.SHILEY ESOPHAGEAL TRACHEAL AIRWAY

IGEL


Recommended
weight range
i-gel
4
50-90kg
Recommended
insertion depth

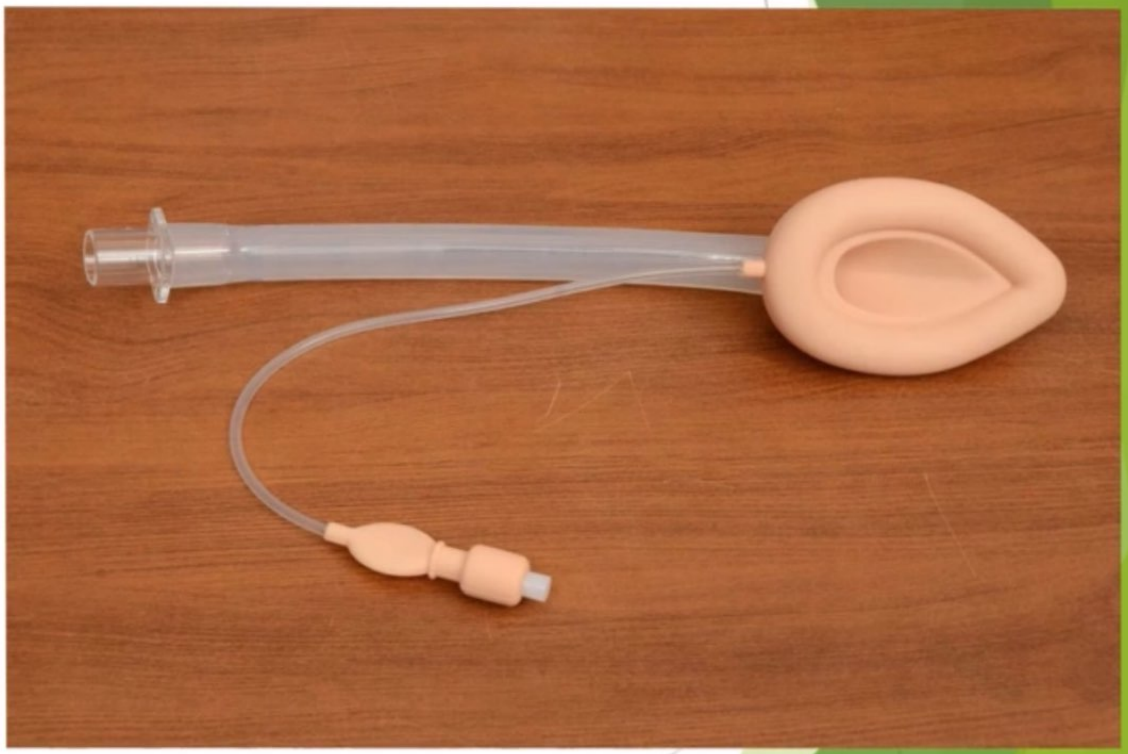
- has soft gel like cuff that seals perilaryngeal structures without inflation
- Technique:lubricate the gel like cuff prior to insertion and then advance the device into posterior pharynx until resistance is met and lips align with lip line on the i gel

KING LARYNGEAL TUBE



- Single lumen tube with a proximal cuff that seals posterior oropharynx while a distal cuff occludes esophagus
- King LT is placed blindly int oropharynx until the lip aligns with the device lip line
- balloon is then inflated to a pressure of 60cm H2O
- after placement,slightly withdraw tube to allow it to fully occlude oropharynx
- Complications : tongue engorgement

LMA



- consist of single cuff inflated with 20-30ml of air
- Technique:place a gloved index finger into oropharynx to guide the device into oropharynx and position the cuff around larynx
- useful when vocal cords are not visualized
- intubating LMA-allow an ETT to be passed through lumen
- Complications:partial or complete airway obstruction and aspiration of gastric contents

SHILEY ESOPHAGEAL TRACHEAL

AIRWAY

- Double lumen tube
- proximal low pressure cuff that seals pharyngeal area and distal cuff that seals esophagus
- after placing proximal balloon is inflated with 80ml of air while distal balloon is inflated with 10ml air
- To detemine location of device,first ventilate through longer blue port-this allows O2 to be delivered through fenestrations between proximal and distal balloon.If chest rise is absent,Endotracheal tube cuff is in trachea,switch to ventilation through shorter,clear/white port